

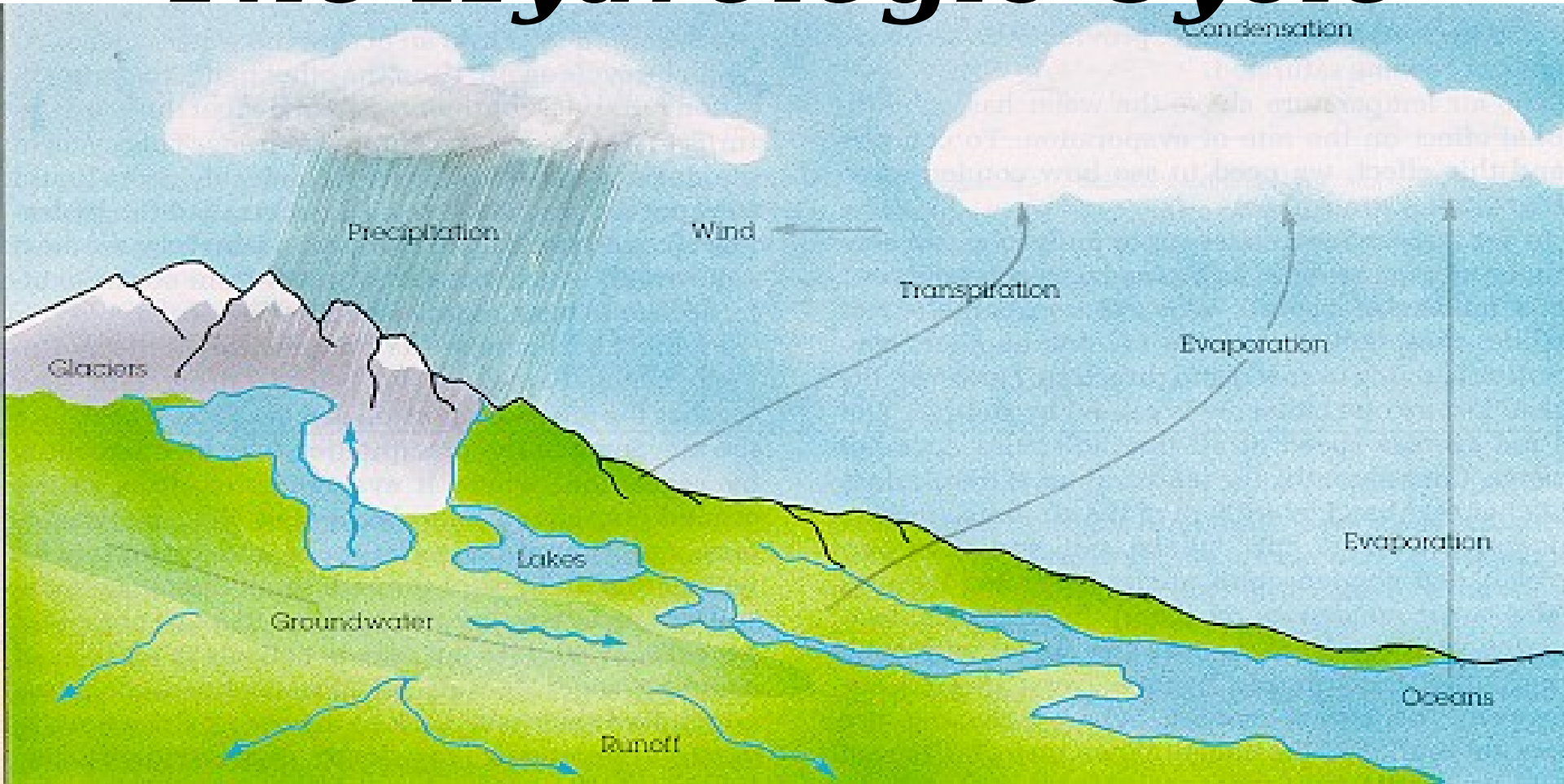
The background image is a wide-angle photograph of a coastal scene. The sky is filled with large, dark, textured clouds, some of which are illuminated from below by a low sun, creating a warm, orange and yellow glow. The sun is visible on the right side of the horizon, partially obscured by clouds. The ocean is a deep blue-grey color, with small waves visible. In the foreground, several dark, rocky islands or sea stacks are scattered across the water. The overall mood is dramatic and atmospheric.

CLOUDS IDENTIFICATION

Of all weather phenomena, clouds are among the most fascinating. From the silky filaments of high altitude cirrus to the towering, threatening mass of storm-bearing cumulonimbus, clouds are as varied as the weather itself.

Apart from their beauty and interest, clouds can provide a useful indication of weather conditions.

The Hydrologic Cycle



To learn more go to the World Weather 2010
project at

[ww2010.atmos.uiuc.edu/
\(Gh\)/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/home.rxml)

There are four ways in which moist air can be lifted to

Orographi

lifting occurs when air is forced upward by a barrier of mountains or hills.

Convective

lifting occurs when air heated at the earth's surface rises in the form of thermal currents or bubbles.


Widespread

ascent results from the interaction of air masses, or the movement of a cold air mass forcing warm air to rise ahead of it.

Mechanical (or frictional)

turbulence occurs when the air flow is deformed into a series of eddies as it moves over the earth's surface.





Three Basic Cloud Types

- **Cumulus**
- **Stratus**
- **Cirrus**

Cumulus Clouds

- **Appear very white in color and become darker as they build in size**
- **Feature horizontal bases and heaping tops**

Stratus Clouds

- Appear as a uniform gray layer
- Cover the sky



Cirrus Clouds

- Appear as a thin and wispy layer

Three Cloud Layers (Etages)

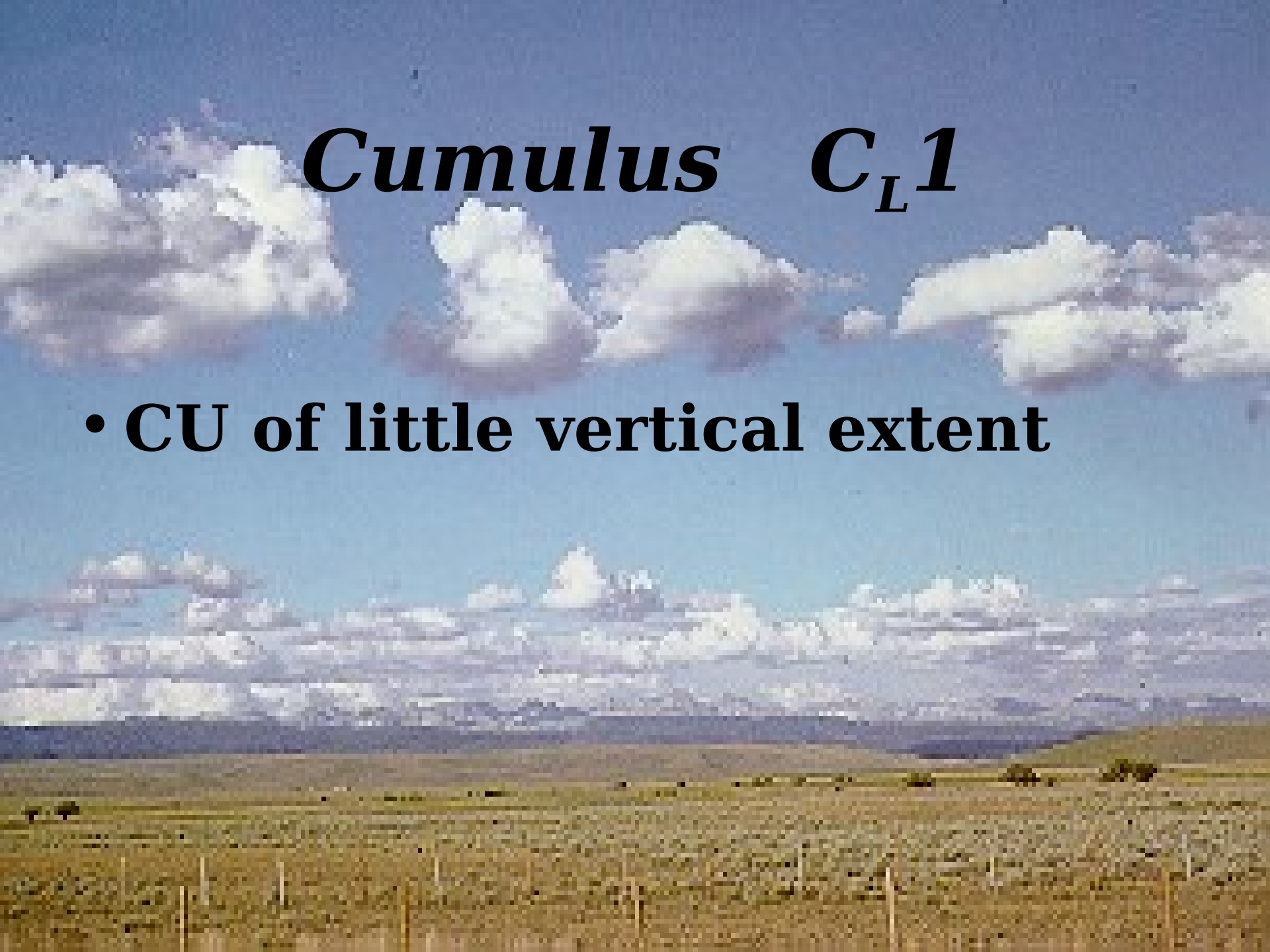
- **Low Clouds C_L**
- **Mid Clouds C_M**
- **High Clouds C_H**

Low Etage ***(up to 6,500 ft)***

- **Cumulus (C_L1)**
- **Towering cumulus (C_L2, C_L3)**
- **Stratocumulus (C_L4, C_L5)**
- **Stratus (C_L6)**
- **Stratus fractus or cumulus fractus (C_L7)**
- **Cumulus and stratocumulus (C_L8)**
- **Cumulonimbus (C_L9)**

Cumulus C_L1

- **CU of little vertical extent**



Cumulus C_L2

- **CU of moderate or strong towering vertical development**
- **Normally accompanied by other CU or SC with bases at the same level**



Towering Cumulus C_L3

- **Earliest form of a cumulonimbus**
- **Contains a summit which lacks cirriform development (no anvil)**

Stratocumulus C_L4

- SC from the spreading out of cumulus or cumulonimbus clouds

Stratocumulus C_L5

- Includes all SC clouds not formed from the spreading out of cumulus

Stratus C_L6

- Continuous sheet or gray layer

Stratus Fractus or Cumulus Fractus C_L7

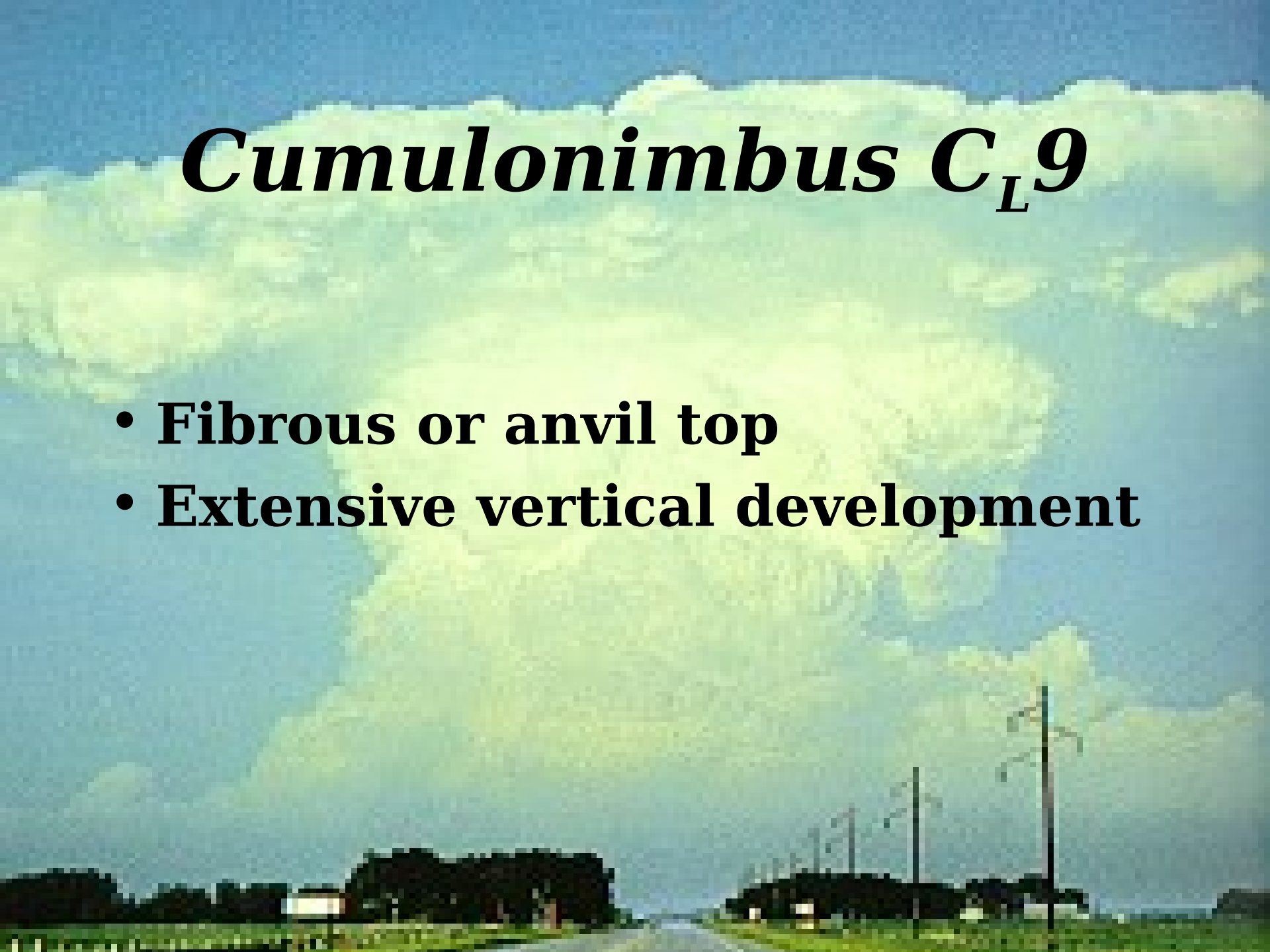
- **Usually found beneath the base of CB clouds that are precipitating**

Cumulus and Stratocumulus C_L8

- **Combination of both CU and SC**
- **Formed by means other than the spreading of cumulus**

Cumulonimbus C_L9

- **Fibrous or anvil top**
- **Extensive vertical development**





Cumulonimbus

Mammatus

C_L9

- **Massive appearance**
- **Fibrous or anvil top**

Mid Etage

(6,500 -18,000 ft)

- **Altostratus (C_M1)**
- **Altostratus or nimbostratus (C_M2)**
- **Alto cumulus ($C_M3, C_M4, C_M5, C_M6, C_M8, C_M9$)**
- **Alto cumulus or alto cumulus with altostratus (C_M7)**

Altostratus C_M1

- **Greater part of cloud is semitransparent**

Altostratus or Nimbostratus C_M2

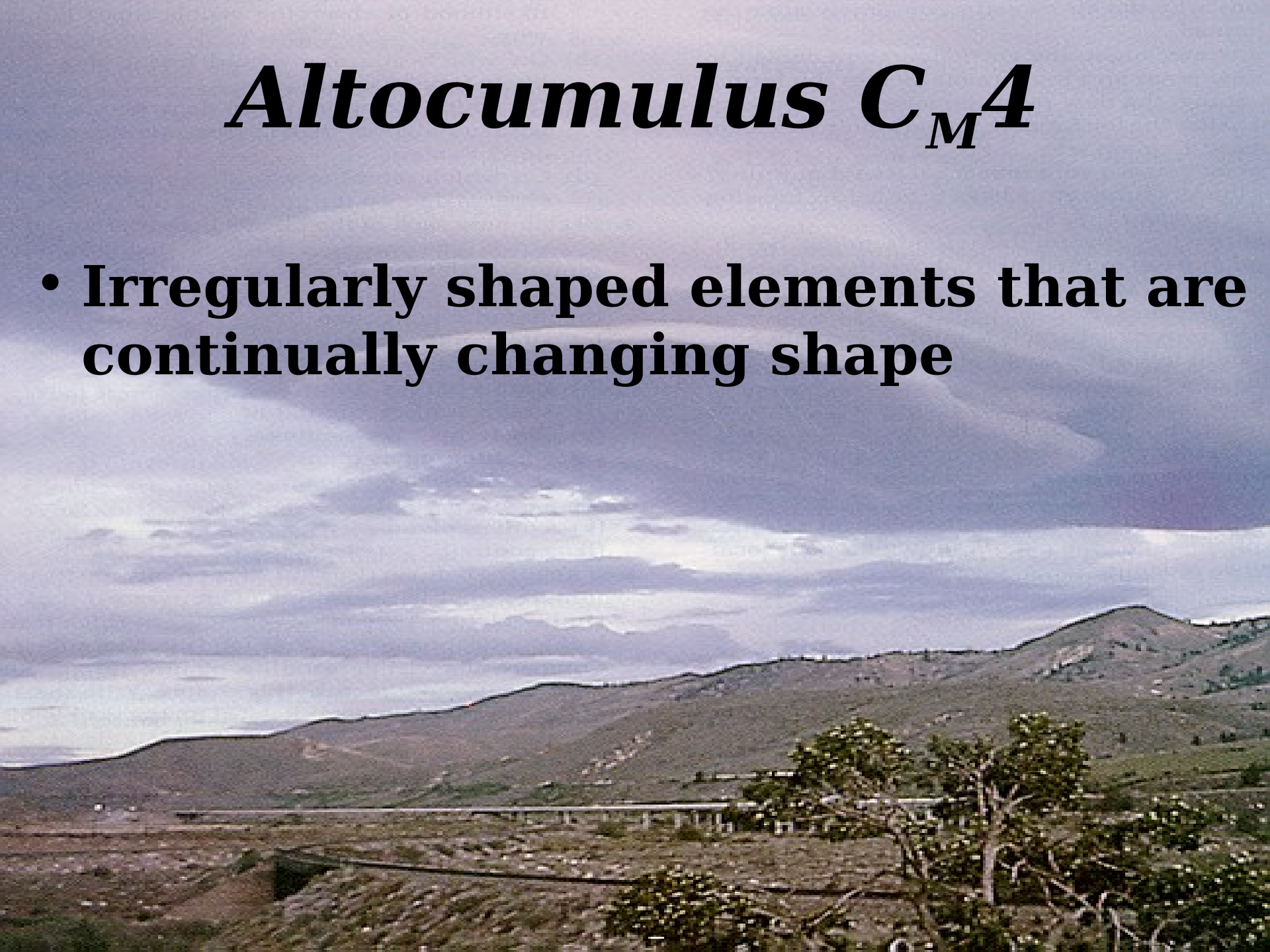
- **Denser and darker cloud which produces heavier precipitation**

Alto cumulus C_M3

- **Predominately semitransparent**
- **Does not progressively invade the sky**

Alto cumulus C_M4

- Irregularly shaped elements that are continually changing shape

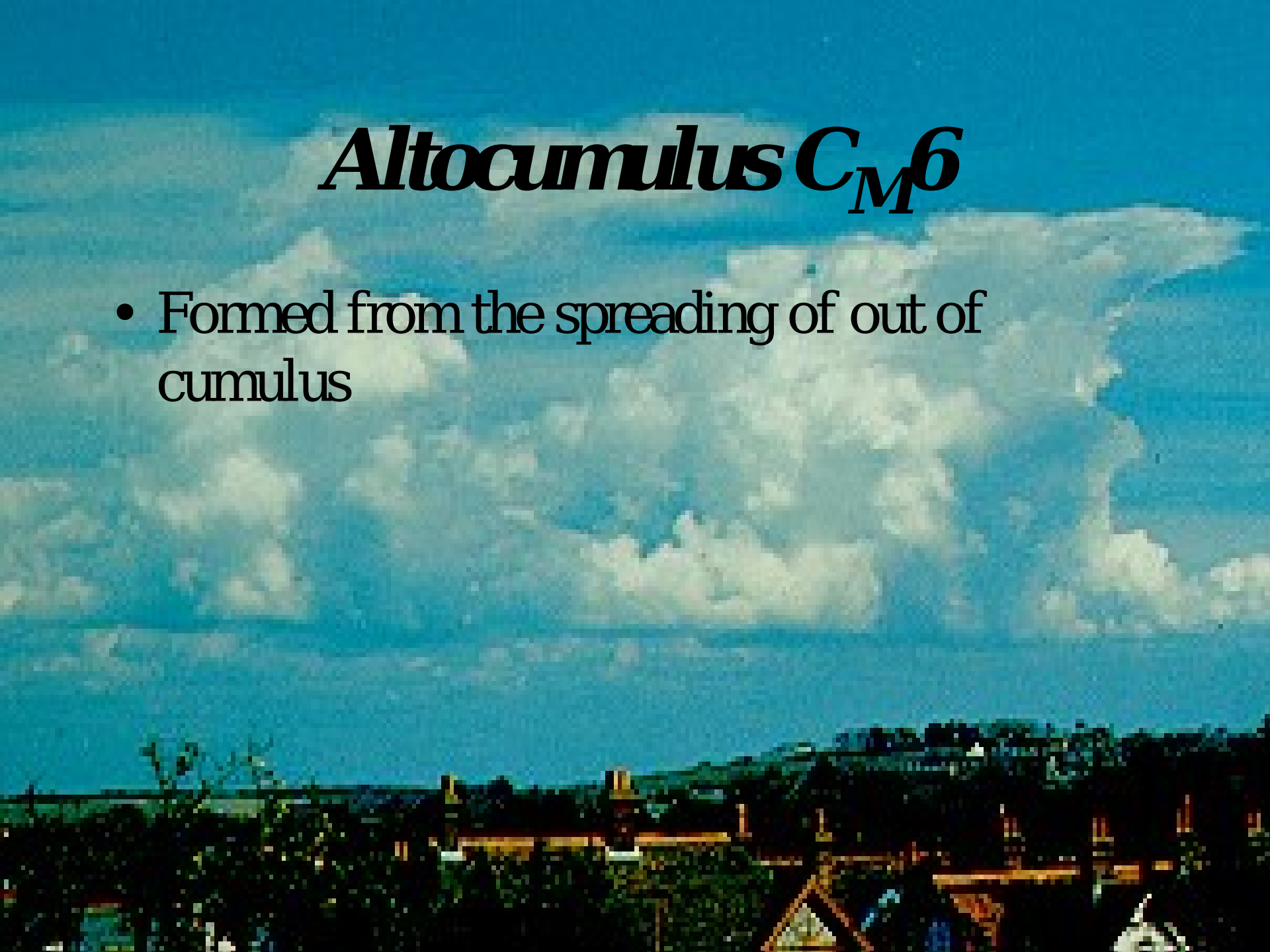


Altocumulus C_M5

- Arranged in semitransparent bands in one or more continuous layers

Alto cumulus C_M6

- Formed from the spreading of out of cumulus



Alto cumulus C_M7

- **Consists of two or more layers of AC**
- **Alto cumulus together with altostratus or nimbostratus**

Alto cumululus with altostratus or nimbostratus C_M 7

- **Consists of AC clouds in two or more layers**



Alto cumulus C_M8

- **Contain tufts or sprouting in the form of small towers or battlements**

The background of the slide is a photograph of a sky with a rainbow. The clouds are dark and pixelated, and the rainbow is visible in the center. The text is overlaid on the sky.

Alto cumulus C_M9

- **Chaotic sky- occurs at multiple levels**

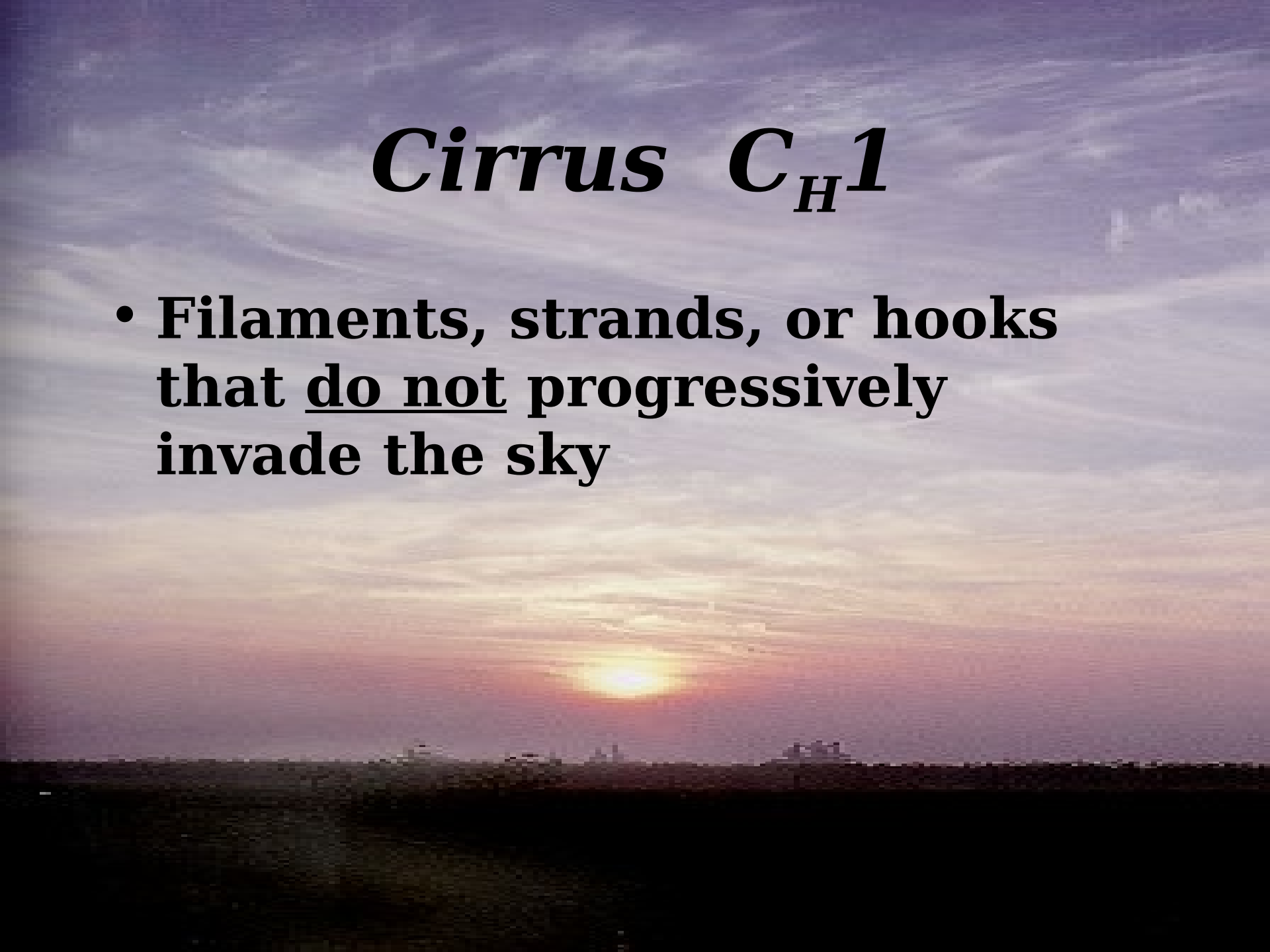
High Etage ***(16,500- 45,000 ft)***

- **Cirrus (C_H1, C_H2, C_H3, C_H4)**
- **Cirrus and Cirrostratus or Cirrostratus alone (C_H5, C_H6)**
- **Cirrostratus (C_H7, C_H8)**
- **Cirrocumulus (C_H9)**



Cirrus C_H1

- Filaments, strands, or hooks that do not progressively invade the sky



Cirrus C_H1

- **Filaments, strands, or hooks that do not progressively invade the sky**

Cirrus C_H2

- Dense, found in patches or entangled sheaves that usually do not increase in size

Cirrus C_H3

- Dense cloud often in the form of an anvil
- Transformed from upper levels of a CB

Cirrus C_H4

- Hooks and filaments that progressively invade the sky
- Becomes more dense

Cirrus and Cirrostratus or Cirrostratus C_H5

- **Progressively increasing but below 45° elevation**



Cirrostratus C_H6

- **Increasing and above 45° elevation**

Cirrostratus C_H^7

- **Uniform veil covering the sky**
- **Can produce the halo phenomenon**

Cirrostratus C_H8

- No longer progressively invades the sky
- Does not completely cover the sky

Cirrocumulus C_H9

- Referred to as a mackerel sky

Now that you have completed this training here are a few web sites to try out your knowledge by taking a quiz to see what you have learned.

The Cloud Quiz from National Weather Service:
www.ncdc.noaa.gov/jmdocs/easy_quiz.html

The cloud Quiz from the Bureau of Meteorology in Australia
sponsored by Mr. Cloud:
www.bom.gov.au/lam/Students_Teachers/animations/cloudzstart.shtml